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Greenhouse Gas Emissions Inventory summary

Table 1: GHG emissions data summary.

| Indicator | T CO ₂ -e FY19 (Base year) | T CO ₂ -e FY20 | T CO ₂ -e FY21 | T CO ₂ -e FY22 |
|---|---|------------------------------|------------------------------|------------------------------|
| Scope 1 (excl LULUCF) | 869.6 | | | |
| Scope 2 | 1,374.2 | | | |
| Scope 3 (excl Waste to Landfill) | 1,185.0 | | | |
| Total mandatory emissions(excl LULUCF and Waste to Landfill) | 3,428.8 | | | |
| Scope 1 from Land use, Land use change and Forestry (LULUCF) | 59,595.6 | | | |
| Scope 3 from Waste to Landfill | 45,561.4 | | | |
| Total gross emissions (incl LULUCF and Waste to Landfill) | 108,585.8 | | | |
| Total mandatory GHG emissions per FTE - Full Time Employee | 6.7 | | | |
| Total mandatory GHG emissions per Turnover/revenue (\$Millions) | 28.9 | | | |
| Total gross GHG emissions per FTE - Full Time Employee | 299.1 | | | |
| Total gross GHG emissions per Turnover/revenue (\$Millions) | 1,295.8 | | | |

Note: total mandatory emissions includes scope 1, scope 2, and scope 3 (i.e. excludes LULUCF and Waste to Landfill).

Table 2: Gross organisation GHG emissions by scope for current measurement year.

| Indicator | Tonnes CO ₂ e |
|--|--------------------------|
| Scope 1 | |
| Land use, Land use change and Forestry (LULUCF) | 59,595.6 |
| Fuels (LPG and natural gas) | 47.5 |
| Refrigerant use | 72.4 |
| Transport fuels (Diesel, Petrol) | 749.7 |
| Scope 2 | |
| Electricity | 1374.2 |
| Scope 3 | |
| Waste to Landfill | 45,561.4 |
| Wastewater biogenic gases (Methane, Nitrous Oxide) | 1007.4 |
| Transmission & Distribution Losses | 109.7 |
| Travel and Accommodation | 67.9 |
| Total Gross Emissions | 108,585.8 |

Table 3: GHG emissions inventory summary by scope and greenhouse gas.

| Component gas | Scope 1 | Scope 2 | Scope 3 | Total | Removals | After removals |
|------------------|-----------------|----------------|-----------------|------------------|----------|----------------|
| CO ₂ | 60,446.2 | 1,311.2 | 166.6 | 61,924,029.3 | 0 | 0 |
| CH ₄ | 3.3 | 61.8 | 45,983.3 | 46,048,406.8 | | |
| N ₂ O | 15.6 | 1.2 | 596.5 | 613,320.2 | | |
| HFCs | | | | | | |
| PFCs | | | | | | |
| SF ₆ | | | | | | |
| Total | 60,465.2 | 1,374.2 | 46,746.4 | 108,585.8 | | |

Table 4: Mobile and stationary combustion of biomass.

| Biomass | Mass | tCO ₂ e |
|-----------------------------|------|--------------------|
| Biomass & Biofuels (Energy) | 0.00 | 0.00 |

Table 5: Deforestation of two hectares or more.

| Source | Area (Ha) | tCO ₂ e |
|---|-----------|--------------------|
| Deforestation tCO ₂ e (tCO ₂ e) | 65.00 | 61,529.3 |

Table 6: GHG stock liability (see Table 13: for mass of individual gases).

| GHG gas | Potential Liability tCO ₂ e |
|--|--|
| Refrigerants – nil stock stored | 0 |
| Diesel Fuel Tanks 2 x 1000L (Great Lakes Centre and Taupo Events Centre) | 5.3 |
| Total | 5.3 |

Table 7: Land-use liabilities.

| Type of sequestration | Liability tCO ₂ e |
|---|------------------------------|
| Contingent liability (carbon sequestered this reporting period) | 1,933.8 |

Table 8: Renewable electricity generation on-site.

| Renewable generation on-site | kWh generated | tCO ₂ e avoided |
|------------------------------|---------------|----------------------------|
| | Unknown | 0 |

1 Introduction

This report is the annual greenhouse gas (GHG) emissions inventory report for Taupo District Council. The inventory is a complete and accurate quantification of the amount of GHG emissions that can be directly attributed to the organisation's operations within the declared boundary and scope for the specified reporting period. The inventory has been prepared in accordance with the requirements of the publication *Measuring Emissions: A Guide for Organisations*, Ministry of Environment 2019. These requirements are based on the *Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)* and *ISO 14064-1:2018 Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals*.

2 Statement of intent

This inventory forms part of Taupo District Council's commitment to measure and manage our emissions.

3 Organisation description

The Taupo District Council is a Local Authority that administers the Taupo District in the central North Island of New Zealand. The district stretches from the small town of Mangakino in the northwest to the Tongariro National Park in the south, and east into the Kaingaroa Forest. The region covers 6,970 km², encompasses Lake Taupo and the main towns of Taupo, Turangi and Mangakino. Council had total revenue of \$83.8 million and employed 363 permanent staff in the financial year ending 30 June 2019.

Council's Long Term Plan for the decade ahead has a vision '*to be the most prosperous and liveable district in the North Island by 2022*'. The Summary Annual Report details a number of initiatives designed to support growth in economically efficient ways and to protect and enhance the environment. Initiatives designed to protect environmental sustainability include:

- Conversion of the district street lights to LED (deemed 90% complete)
- Considerable water and waste water services upgrades
- Developed a Waste Management and Minimisation Plan 2018
- Stormwater quality improvements

4 Organisational boundaries included for this reporting period

Organisational boundaries were set with reference to the methodology described in the GHG Protocol and ISO 14064-1:2018 standards. The GHG Protocol allows two distinct approaches to be used to consolidate GHG emissions: the equity share and control (financial or operational) approaches. We used an operational control consolidation approach to account for emissions.

The first figure below shows the organisational structure for the Taupo District Council and its main Groups. Councillors lead high level decision-making for the organisation. The Senior Leadership Team oversees management of the organisation and fulfilment of the decisions made by Council. The Senior Leadership Team does this by managing and co-ordinating the work of the seven Groups. Each Group employs staff and contractors split into Business Units. For clarification, this inventory encompasses all of Taupo District Council activities shown in Figure 1 unless otherwise noted.

Figure 1: Taupo District Council Organisational structure

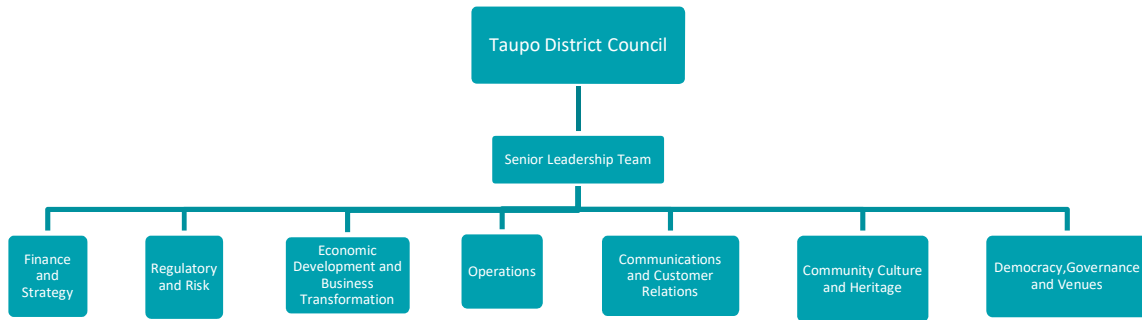


Figure 2 below shows the Taupo District Council boundary bordered by the double line. Service centres and other facilities are spread across the district in a large area.

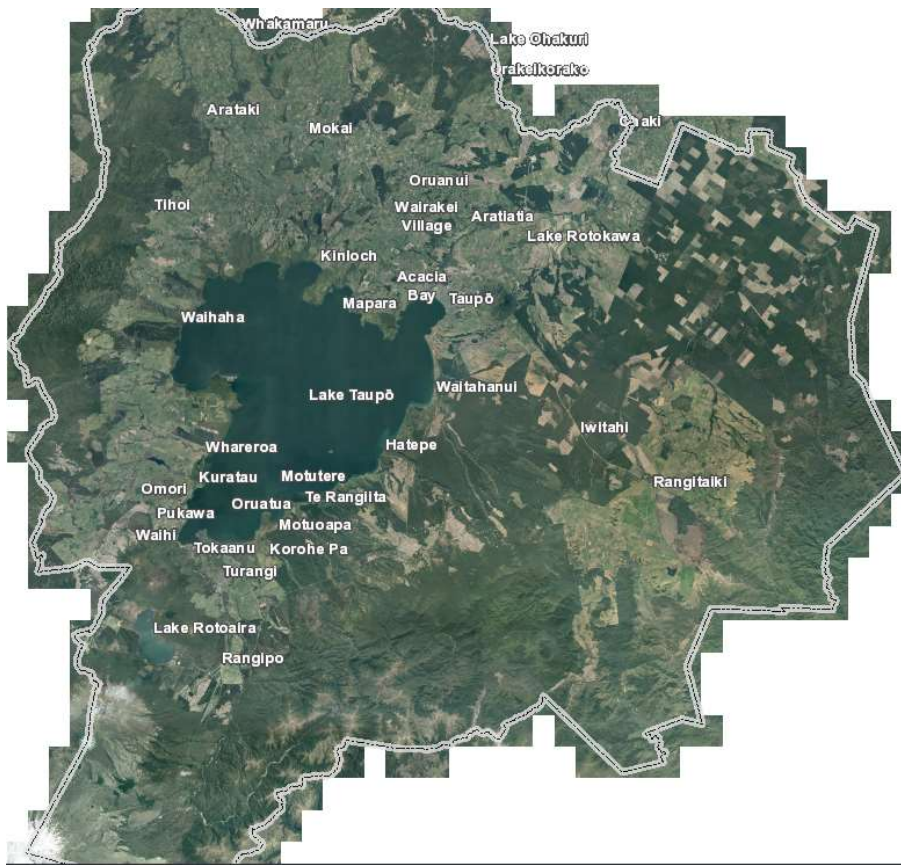


Figure 2: Taupo District Council region.

5 Organisational business units excluded from inventory

Taupo District Council has two main Council Controlled Organisations (CCO's) being:

- Destination Great Lake Taupo that is 100% owned by Council
- Taupo Airport Authority that is 50% owned by Council and 50% owned by the Ministry of Transport

Operational control is 100% divested to these CCO's therefore under the operational control model are deemed outside the inventory boundary and all GHG emissions excluded.

6 GHG emissions source inclusions

The GHG emissions sources included in this inventory were identified with reference to the methodology in the *GHG Protocol* and *ISO14064-1:2018* standards. As adapted from the *GHG Protocol*, these emissions were classified under the following categories:

- **Scope 1 - Direct GHG emissions:** emissions from sources that are owned or controlled by the company.
Examples of Scope 1 emissions are from the combustion of fuel in the vehicle fleet, natural gas in boilers, refrigerant use and forestry.
- **Scope 2 - Indirect GHG emissions:** emissions from the generation of purchased electricity consumed by the company.
- **Scope 3 - Indirect GHG emissions:** emissions that occur as a consequence of the company's activities but from sources not owned or controlled by the company.

Examples of Scope 3 emissions are business travel, freight, transmission and distribution losses and wastewater treatment.

Table 9: GHG emissions sources included in the inventory.

| Group/Business unit | GHG emissions source | GHG emissions level scope | Data source | Data collection unit | Uncertainty (description) |
|---------------------|--|---------------------------|--|---------------------------------------|--|
| All Council | Air travel domestic (national average) Air Travel International | Scope 3 | Data was received from Rachel Handcock, Finance | Individual flights and km's travelled | It is assumed data source represents a complete and accurate account of all travel activity. However some data could be missing. |
| All Council | Accommodation | Scope 3 | Data was received from Rachel Handcock, Finance | Room nights and locations | It is assumed data source represents a complete and accurate account of all travel activity. However some data could be missing. |
| All Council | Rental Cars Car – petrol, <2000cc | Scope 1 | Data was not available for the use of rental cars. | days | No documentation was found relating to the hire of rental cars. There is a possibility that other business groups directly hired rental cars, however if so, this would be a small number and is deemed <i>de minimis</i> . |
| All Council | Waste to Landfill (Note - this emission source is reported separately in the inventory) | Scope 3 | Total landfill waste volumes provided by Brent Aitken Asset Manager Solid Waste. Landfill waste composition taken from Taupo District Waste Survey 2017 | Tonnes | It is assumed data source represents an accurate account of waste volumes to landfill. Waste has been calculated as General Waste. All Council direct operations waste is assumed to be included in this data. |

| Group/Business unit | GHG emissions source | GHG emissions level scope | Data source | Data collection unit | Uncertainty (description) |
|---------------------|--|---------------------------|--|----------------------|--|
| All Council | Diesel Unleaded 91 Unleaded 95 | Scope 1 | Consumption reports provided by Deb Atkinson Asset/Property/Fleet Manager via fuel card. | Lts | It is assumed the supplier reports are complete and accurate for fleet vehicles. A small number of fuel purchases could be via credit card, but this is deemed to be <i>de minimis</i> . |
| All Council | LPG | Scope 1 | Consumption reports provided by Deb Atkinson Asset/Property/Fleet Manager via fuel card. | kg | Data was provided via the fuel card system and is assumed to be accurate. |
| All Council | Electricity | Scope 2 | Consumption data report provided from Meridian Energy. | kWh | We are confident we have accurate data for all meters. |
| Operations | Wastewater Treatment Plants - Biogenic Emissions (Methane and Nitrous Oxide) | Scope 3 | Wastewater inflows for each WWTP were provided from Council records by Kevin Sears, Operations Manager Three Waters. | m ³ | Wastewater inflows should be accurate. Emission factors are based on the average nationwide factor for WWTPs. This may not necessarily accurately reflect the WWTP's processes. |
| All Council | Land use, Land use change and Forestry (LULUCF) The emissions are reported separately in this inventory | Scope 1 | Data was arranged by Rachel Handcock, Finance from John Hura, Planning Manager, NZ Forest Managers Ltd | Ha | Data is provided by forestry management contractors is deemed to be accurate. This includes planted area and species and deforested areas in the period. |
| Property | Refrigerants | Scope 1 | Property Dept schedule of HVAC plant and refrigerants | kg | Property Dept provided a schedule of all HVAC/Refrig plant with refrigerant volumes. GHG Protocol HFC Tool (Version 1.0) Table 2 was used to determine annual % loss of refrigerant. |

| Group/Business unit | GHG emissions source | GHG emissions level scope | Data source | Data collection unit | Uncertainty (description) |
|---------------------|----------------------|---------------------------|---|----------------------|--|
| Operations | Water | | Water consumption from Council facilities | m3 | This data should be collated and included in future inventories. |

7 GHG emissions source exclusions

Taupo District Council recognises the extent of Scope 3 emissions can be significant. We have chosen to declare the following notable emissions sources that have been excluded from the emissions inventory.

Table 10: GHG emissions sources excluded from the inventory

| Business unit | GHG emissions source | GHG emissions level scope | Reason for exclusion |
|---------------|--|---------------------------|---|
| All Council | Materials (Concrete, Steel, Aluminium) | Scope 3 | The cost and difficulty of obtaining the information was considered too high. |

8 Data collection and uncertainties

Table 9 gives an overview of how data was collected for each GHG emissions source, the source of the data and an explanation of any uncertainties or assumptions.

A calculation methodology has been used for quantifying the emissions inventory using emissions source activity data multiplied by emission or removal factors. All emission factors were sourced from the Ministry for the Environment's 2019 *Measuring Emissions: A Guide for Organisations*.

Additional data collection uncertainties are as follows:

- The actual volume of diesel and petrol stored in any bulk tanks on site is not measured. For the purpose of this inventory, the rated capacity of the tanks will be used.
- Refrigeration losses have been calculated using GHG Protocol HFC Tool (Version 1.0) Table 2 based on a percentage of total refrigerant charge.
The accuracy of this would be improved by having the Mechanical Services Contractor record all volumes of refrigerants used during the reporting period.
- Collection of waste volumes from council facilities has not been available. This should be tracked and included in future GHG Emissions Inventory Reports.

9 GHG emissions calculations and results

GHG emissions for the organisation for this measurement period are provided in the GHG Inventory summary section at the start of this report. The Land use, Land use change and Forestry and Waste to Landfill emissions are reported separately and excluded from most Figures.

The following Figures give an overview of where the emissions are occurring across Taupo District Council. The forestry impact (LULUCF) and Waste to Landfill contribute 97% of the total TDC gross emissions. As such they are reported separately.

Figure 3: TDC Total gross GHG emissions (tonnes CO₂e).

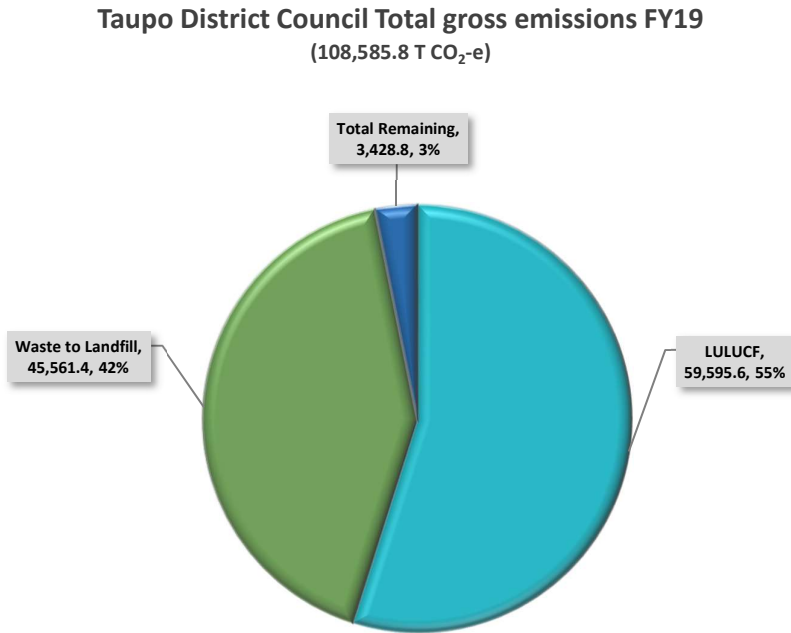


Figure 4: TDC GHG emissions by source (tonnes CO₂e) excluding LULUCF and Waste to Landfill.

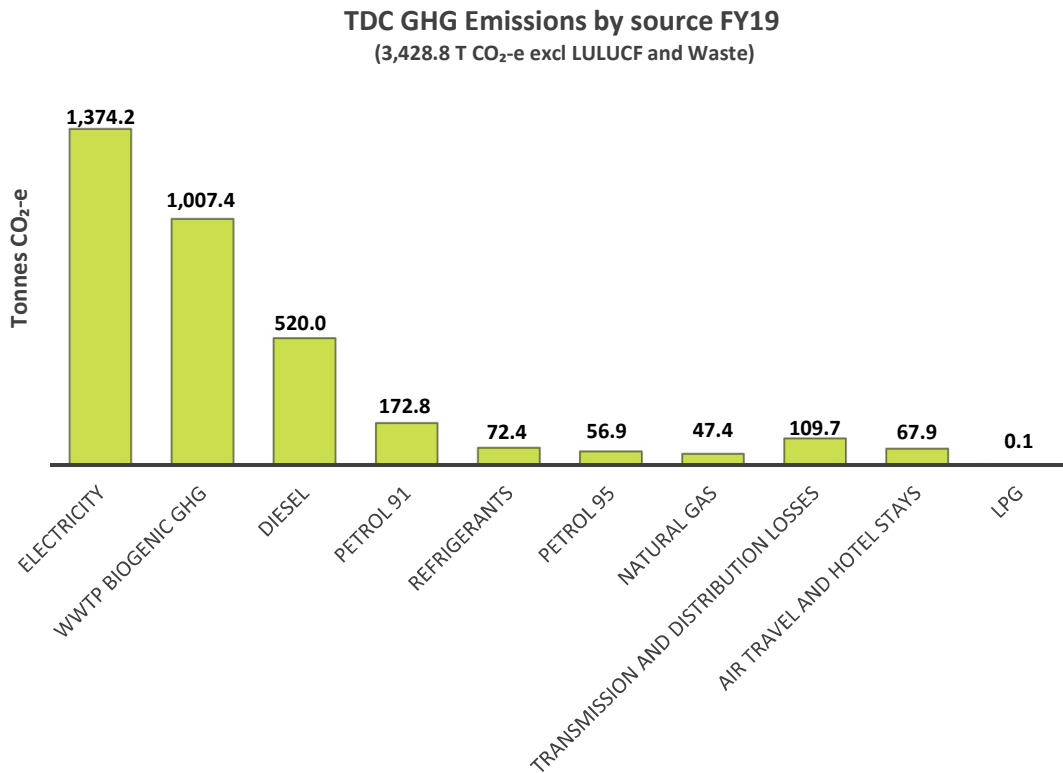


Figure 5: TDC GHG emissions by source (tonnes CO₂e and %) excluding LULUCF and Waste to Landfill.

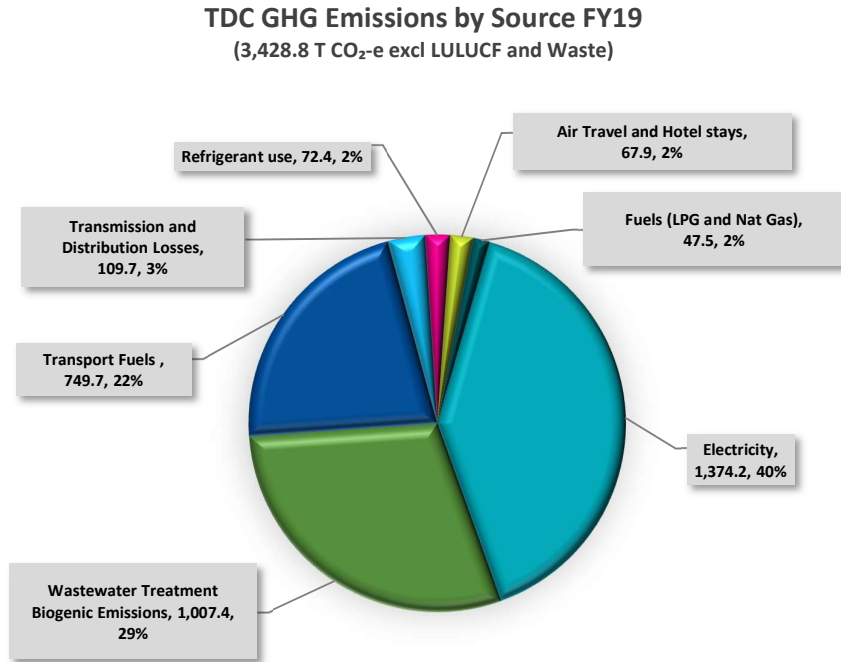
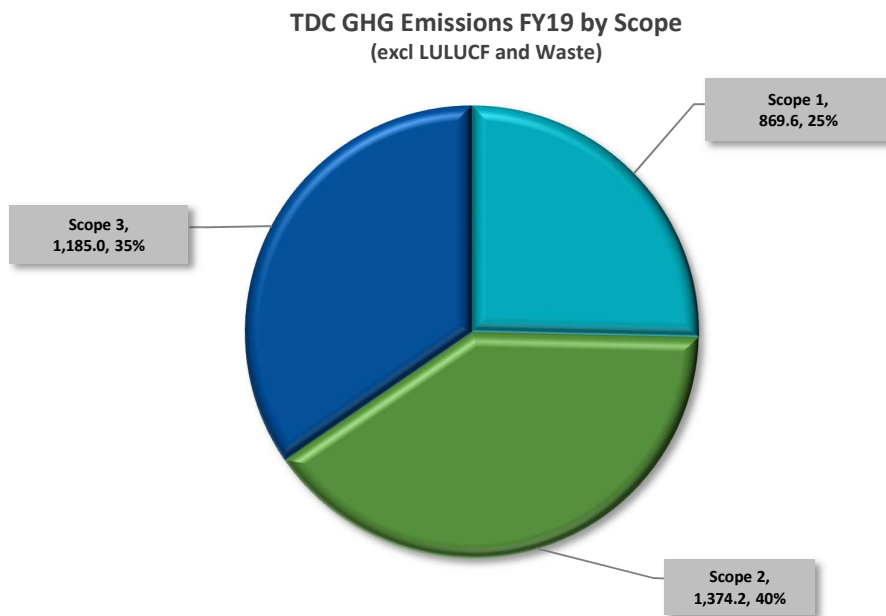


Figure 6: TDC GHG emissions by Scope (excluding LULUCF and Waste to Landfill).



10 Liabilities

10.1 GHG stocks held

HFCs, PFCs and SF₆ represent GHGs with high global warming potentials. Their accidental release could result in a large increase in emissions for the reporting period. Therefore, any GHG stocks are included in the greenhouse gas emissions inventory summary section at the start of this report (page 6), to identify significant liabilities and implement procedures for minimising the risk of their accidental release.

Table 9: HFCs, PFCs and SF₆ GHG emissions and liabilities.

| GHG gas | Amount held - start of reporting period | Amount held - end of reporting period | Potential Liability tCO ₂ e |
|---|---|---------------------------------------|--|
| Refrigerants | Reported nil | Reported nil | 0 |
| Diesel Fuel Tanks@ Great Lakes Ctr and Taupo Events Ctr | 2,000lt | 2,000lt | 5.4 |
| Total | | | 5.4 |

10.2 Land-use, Land use change and Forestry

Organisations that own land subject to land-use change may achieve sequestration of carbon dioxide through a change in the carbon stock on that land. If a sequestration is claimed, this also represents a liability in future years should fire, flood or other management activities release the stored carbon.

The LULUCF sector is responsible for both emitting GHG to atmosphere (emissions i.e. through harvesting and deforestation) and removing GHG from the atmosphere (removals through planting and vegetation growth and increasing carbon stored in soils). This is a significant emission for Taupo District Council due to the large area of deforestation that occurred in this reporting period.

11 References

International Organisation for Standardisation ISO 14064-1:2006. Greenhouse gases – Part 1: *Specification with guidance at the organisation level for quantification and reporting of greenhouse gas GHG emissions and removals*. Geneva: ISO.

World Resources Institute and World Business Council for Sustainable Development. 2004. *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (revised). Geneva: WBCSD.

Appendix 1

Further GHG emissions supporting data is available from Power Solutions Ltd. The MfE Carbon Emissions Workbook used to prepare this GHG Emissions Inventory can be made available if required.